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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/759,885	01/15/2004	Edward W. Sheridan	EM- 1989	8465

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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/759,885	SHERIDAN ET AL.	
	Examiner	Art Unit	
	Jason L. Savage	1775	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 August 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-8 and 10-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-8 and 10-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Claim Objections

Claims 1-8 and 10-17 are objected to because of the following informalities: In claim 1, lines 2-3, the recitation that there is a layer of material containing metals which are substantially not in oxide form, namely (emphasis added)... is objected to since the limitation claim could be interpreted as being a preferred embodiment and not necessarily a required limitation. For the purposes of Examination, the claim has been treated as meaning "metals not in oxide form, wherein the metal compositions comprise... ". Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-8 and 10-21 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The limitation that the layer not in oxide form be selected from "non-adducted metal hydrides" is not described in the specification or claims as originally filed and is considered new matter. The mere absence of a positive recitation is not basis for an

exclusion (See *Ex parte Graselli*, 231 USPQ 3693 (Bd. App. 1983), *aff 'd mem.*, 738 F.2d 453 (Fed. Cir. 1984).

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-8 and 10-21 are rejected under 35 U.S.C. 103(a) as obvious over Danen et al. (US 5,266,132).

Danen teaches an energetic material comprising a plurality of layers **A** and a plurality of layers of materials **B** which are reactive with one another wherein the layers have thicknesses from between 1-1000 nm (col. 2, ln. 16-68 and Figure 1) which anticipates the range of the layer thickness being less than or equal to approximately 10 nm. Danen further teaches that the layers may comprise a metal such as aluminum and an oxide such as cupric oxide (col. 3, ln. 15-33).

Regarding the limitation that the layer in non-oxide form be selected from non-adducted metal hydrides and metals with interstitial hydrogen , Danen teaches that the reacting materials may include aluminum, titanium, magnesium, lithium and hydrides thereof (col. 5, ln. 9-44). Although Danen does not exemplify an embodiment wherein the metal hydride materials are non-adducted or contain interstitial hydrogen, it would have been within the purview of one of ordinary skill in the art to have selected any known metal hydride of the claimed metals with a reasonable expectation of success.

Absent a teaching of the criticality or showing of unexpected results of the metal hydride compounds being non-adducted metal hydrides, it would not provide a patentable distinction over the prior art.

Regarding claim 5, Danen teaches that layers A and B are adjacent to one another (Figure 1). In the alternative, although Danen teaches a buffer layer **b** is formed between them, Danen teaches that the buffer may be a self-buffering which results from an initial reaction between adjacent layers of the layers **A** and **B** (col. 3, ln. 15-33). As such, the composite of Danen would meet the limitation of layers **A** and **B** being adjacent to one another.

Regarding claims 7-8, 10-11 and 18-20, Danen teaches that the reacting materials may include aluminum, titanium, magnesium, lithium and hydrides thereof and that the oxide materials may include Fe (col. 5, ln. 9-44).

Regarding claim 12, the sputtering deposition of Danen (col. 3, ln. 43-62) would result in the same composite as that claimed by Applicant.

Regarding claim 13, Danen teaches composite may be formed on any conventional substrate material including those claimed by Applicant (col. 4, ln. 20-30).

Regarding claim 14, Danen teaches the composite is suitable for use in explosive applications (col. 1, ln. 9-15). As such, it would have been obvious to one of ordinary skill in the art to have employed energetic materials typically employed in explosive applications such as those claimed into the energetic material of Danen with a reasonable expectation of success.

Regarding claim 15, Danen teaches the same energetic material structure as that claimed by Applicant. Furthermore, Danen teaches the composite is suitable for use in explosive applications (col. 1, ln. 9-15). As such, one would expect that energetic fragments would form upon detonation just as that claimed by Applicant.

Regarding claim 16, Danen does not exemplify an embodiment wherein fragments of the detonated energetic material would comprise Mg and P. However, Danen does recite that Mg and the reaction product formed by reaction of Mg is suitable for use in the energetic material (col. 5, ln. 30-34). Absent a teaching of the criticality or showing of unexpected results from the detonated material containing some amount of P in the formed Mg containing fragments, it would not provide a patentable distinction over the prior art of Danen,

Regarding claim 17, the energetic material of Danen would be just as suitable for use in an anti-tamper device as the energetic device claimed since Danen teaches the same structure which is claimed.

Response to Arguments

Applicant's arguments filed 8-29-07 have been fully considered but they are not persuasive.

Claim Objection

Applicant states that claim 1 has been amended to clarify the limitation to overcome the claim objection. However, claim 1 is still objected to since the use of

"namely" makes the scope of the claim uncertain since it could be interpreted as being a preferred embodiment and not necessarily a required limitation.

Claim Rejections – 35 USC 112

Applicant argues that the invention is directed to non-adducted metal hydrides and is inherent in the disclosure and figures, particularly Fig. 4, page 4 lines 22-23 and page 5, lines 20-25 and one of ordinary skill in the art would so read. While Applicant describes species that can be non-adducted, there is no support in the disclosure as originally filed that the metal hydride must be non-adducted.

Any negative limitation or exclusionary proviso must have basis in the original disclosure. See Ex parte Grasselli, 231 USPQ 393 (Bd. App. 1983) aff'd mem., 738 F.2d 453 (Fed Cir 1984). The mere absence of a positive recitation is not basis for an exclusion.

Claim Rejections – 35 USC 103

Applicant argues that the claims require the layers having a thickness of equal to or less than 10 nm is not met by Danen since it teaches most inventive composites utilize layers having thicknesses in the range from about 10 nm – 200 nm. However, Danen explicitly recites the layer thicknesses may be as small as 1 nm (col.. 2, ln. 46-49) which overlaps the range claimed by Applicant between 1-10 nm.

Applicant further states that Applicant's invention as claimed teaches how to generate an energetic material composition that produces hydrogen gas as a reaction product by the inclusion of metal hydride reactants. This argument is not

commensurate in scope with the claims as there is no limitation drawn to the production of hydrogen gas as a reaction product.

Applicant also argues that Danen does not disclose a true hydride, but rather only a hydride combined with another compound to form an adduct. While Danen does exemplify an adducted metal hydride, all the disclosures in a reference must be evaluated for what they fairly teach one of ordinary skill in the art. Danen teaches the reacting materials may include aluminum, titanium, magnesium, lithium and hydrides thereof (col. 5, ln. 9-44). As such, the use of non-adducted hydrides of the metals described would have been obvious. Applicant's assertion that Danen teaches away from the use of non-adducted metal hydrides or metals with interstitial hydrogen due to the disclosure of a single embodiment which uses an adducted metal hydride is not persuasive.

Related Prior Art

The following is a listing of prior art which as deemed pertinent to the present invention:

Nielson et al (US 6,224,099) teaches an energetic materials comprising metal materials including hydrides and oxidizing materials including materials such as RDX (col. 3, ln. 50-67).

Hinshaw et al. (US 5,439,537) teaches an energetic material comprising metal material and an oxidizing agent to form oxide portions. Hinshaw further teaches that hydrides of the metal may be employed in the energetic material (col. 3, ln. 25-48).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason L. Savage whose telephone number is 571-272-1542. The examiner can normally be reached on M-F 6:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on 571-272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jason Savage
9-21-07

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SUPERVISORY P[illegible]MINER
9/26/7